

CLIMATOLOGICAL DATA FOR JULY, 1912.

DISTRICT No. 4, THE LAKE REGION.

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GENERAL SUMMARY.

The weather of July, 1912, in the Lake region presented several features of interest. The month was divided into two almost equal periods, the first of temperatures above, and the second of temperatures below, normal values. Precipitation was quite irregularly distributed, although comparatively frequent over the western sections throughout the month, and over the district generally after the first decade. An unusually large number of severe thunderstorms occurred, with heavy rainfalls. Damage by rain, wind, or lightning in connection with these storms was reported from practically all portions of the district. There was a number of instances of loss of life, while damage to buildings and trees was quite common. The frequent rains from the Lake Erie region westward interfered considerably with harvesting and occasioned some loss of crops.

Over the western sections of the district the relative humidity was abnormally high for the season, causing pronounced sultriness, especially during the period of high temperatures. At Chicago, where a continuous record of relative humidity is maintained, the average of the bihourly readings for July, 1912, was 72.4 per cent, higher than that of July, 1911, by 14.1 per cent. The means of the bihourly readings were as follows:

	2 a. m.	4 a. m.	6 a. m.	8 a. m.	10 a. m.	12 m.	2 p. m.	4 p. m.	6 p. m.	8 p. m.	10 p. m.	12 m.
July, 1912.....	78	79	80	75	70	68	66	64	68	71	74	76
July, 1911	65	68	67	60	52	51	51	51	52	60	61	64

The weather conditions of the first half of the month—high temperatures over the eastern and western sections, with only a few light, scattered showers in the former area, and comparatively frequent, heavy rains and excessive humidity over the latter—are easily traceable to the general pressure distribution of that period. There was a remarkable persistency of high atmospheric pressure over the Atlantic coast, and a gradual decrease thence westward to a region of low barometer in the great central valleys. The slope of the isobaric surfaces across the Lake region was, on the whole, very faint, and the resultant light winds over the New York and Vermont sections permitted the more than average sunshine greater effectiveness in heating the surface strata. From lower Michigan westward the importation of warm, moist air from the southward along the front of the low pressure area maintained high temperatures and humidity and occasioned the greater number of showers and thunderstorms. Between, immediately to the south and west of Lake Erie, there appeared a "neutral" zone, where as a rule moderate temperatures prevailed, none of the regular Weather Bureau stations therein reporting a single day with mean temperature

exceeding the normal by more than 8° , while in the regions on either side departures of $+10^{\circ}$ to $+14^{\circ}$ were frequent.

After the breaking up on the 14th and 15th of the pressure distribution described above, the general storm movement was more active, but the weather of the district was dominated chiefly by high pressure areas. Low temperatures for the season prevailed until the close of the period, unbroken over the eastern sections, and only moderated in the regions of Lakes Michigan and Superior on the 24th and 28th by depressions which passed across the northern limits of the upper lakes. During this period rainfall was frequent, and in many localities the falls were exceptionally heavy.

The following table presents the chief features of meteorological interest in the various portions of the district:

Portions of States.	Mean temperature.	Departure.	Mean daily range.	Mean precipitation.	Departure.	Greatest precipitation in 24 hours.	Number of days.			Prevailing wind direction.
							With 0.01 inch or more.	Clear.	Partly cloudy	
Minnesota.....	64.4	-0.7	17.9	2.08	-1.99	0.58	10	15	10	6 ne.
Wisconsin.....	68.0	-0.6	17.0	6.35	+3.54	7.39	12	13	12	6 se.
Illinois.....	72.9	+0.5	13.2	3.86	+0.22	1.87	9	8	8	sw.
Indiana.....	73.1	+0.1	18.1	3.86	-0.20	3.04	10	12	11	sw.
Upper Michigan.....	64.7	+0.3	18.4	2.58	-0.96	2.15	9	12	11	s. s.
Lower Michigan.....	69.3	-0.8	17.9	4.39	+1.42	4.30	10	10	13	sw.
Ohio.....	72.7	-0.3	14.3	5.64	+1.90	3.30	11	10	14	7 sw.
Pennsylvania.....	70.4	-1.4	12.9	3.09	-0.12	1.33	12	4	19	s. s.
New York.....	68.7	-0.1	18.6	2.94	-1.19	3.02	9	15	12	w.
Vermont.....	67.8	-0.5	24.0	2.73	-1.21	1.20	10	14	12	s.

TEMPERATURE.

Except in a few localities, the mean temperatures of the month were below the July normals save in upper Michigan. The departures, however, seldom exceeded 1° and in many instances were less than $\frac{1}{2}^{\circ}$. These seasonal means are not, as might be expected, the result of seasonal conditions from day to day, but represent a balance between the heat of the first half of the month and the cold of the last half. The absolute range for the district was 78° .

The hot period of the first half of July culminated on the 6-9th generally, although a number of stations, especially in northern Ohio, reported their maximum temperatures on other dates. Readings of from 90° to 99° were made in all portions of the district, but 100° occurred at only one station—Deer Park, Mich., on the 6th. West of New York State the coldest weather of the month was experienced on the 16th-19th, under the influence of pronounced areas of high atmospheric pressure, and frosts occurred in the northwestern sections. Some damage resulted in various places, the frosts being reported as killing in the Knife River Valley of Minnesota, Florence County, Wis., and in portions of

upper Michigan. Killing frosts or freezing temperatures occurred also during the month at Castile, Gabriels, Lake Placid Club, Angelica, Nehasane, and Tupper Lake, all in the highlands of New York. In this section of the district and in that of Vermont the lowest temperatures were recorded for the most part on the 1st, just before the period of hot weather set in. The lowest reading made in any portion of the Lake region during July was 22°, at Seney, in the upper peninsula of Michigan, on the 16th.

PRECIPITATION.

Precipitation was below the normal over the Lake Superior region and from the Pennsylvania section eastward. The departures reached about -1.20 inches in New York and Vermont and nearly -2 inches in the extreme northwest. Throughout the remainder of the district, in general, the amounts received were greater than the seasonal average and were exceptionally heavy in portions of Wisconsin, lower Michigan, and Ohio. In eastern Wisconsin out of 30 stations 18 reported monthly amounts of 6 inches or more; in northern Ohio out of 30 stations 13 received 6 inches or more; while several stations in Wisconsin and lower Michigan recorded more than 10 inches. In northern Indiana, although the table shows a deficiency of -0.20 inch, it is probable that were normals available for the entire number of stations in that section the average would show an excess rather than a deficiency.

As previously stated, but little rain fell in the eastern portions of the district until after the close of the first decade, and droughty conditions continued from the previous month. The streams in some localities became very low, and fear was entertained that industries depending upon water power would be forced to suspend operations even in the latter portion of the month, when showers were frequent, as most of the water which fell was retained in the overdry soil. Except in the extreme northwestern sections, the remainder of the district was visited by frequent rains during the whole month and many of the individual falls were excessive. On the 23d-24th 7.31 inches fell in 24 hours at Cecil, Wis., and 6.31 inches at Manitowoc, in the same State. At the latter place the observer reports the amount as the greatest 24-hour fall in 50 years of record.

The 6th-7th, 13th-16th, 20th-21st, 23d-24th, and 28th-30th marked the periods of heaviest rainfall, and thunderstorms were numerous on these dates. In lower Michigan the severity of these storms was especially pronounced on the 13th and 28th. A special report is printed below, descriptive of a small tornado which passed through Grand Rapids on the former date. On the 28th at Harrison, in Clare County, a severe thunderstorm with high winds was accompanied by heavy hail which completely covered the ground and in places was banked to a depth of 12 to 18 inches.

MISCELLANEOUS.

During dense fog on the southern end of Lake Huron on the early morning of the 14th the steamer *Northern Queen* rammed the steamer *J. G. Grammar*, which was lying at anchor north of the Corsica Shoal Lightship. The injured vessel sank within a few minutes, but was subsequently raised. None of the crew was lost. Dense fog also occurred in several other localities during the course of the month, but no further reports of damage from this cause have been received.

JULY, 1912, LAKE LEVELS.

The following data are from the report of the United States Lake Survey office:

Lakes.	Above tidewater, New York.
	Feet.
Superior.....	602.26
Michigan-Huron.....	580.48
Erie.....	572.56
Ontario.....	247.01

Lake Superior is 0.04 foot higher than last month, 0.64 foot higher than a year ago, 0.34 foot below the average stage of July for the last 10 years, 1.56 feet below the high stage of July, 1876, and 0.78 foot above the low stage of July, 1879. It will probably rise 0.1 foot during August.

Lakes Michigan-Huron are at the same stage as last month, 0.59 foot higher than a year ago, 0.62 foot below the average stage of July for the last 10 years, 3.10 feet below the high stage of July, 1876, and 0.60 foot above the low stage of July, 1896. They will probably fall 0.1 foot during August.

Lake Erie is 0.08 foot lower than last month, 0.81 foot higher than a year ago, 0.30 foot lower than the average stage of July for the last 10 years, 1.85 feet below the high stage of July, 1876, and 1.10 feet above the low stage of July, 1895. It will probably fall 0.2 foot during August.

Lake Ontario is 0.33 foot lower than last month, 1.47 feet higher than a year ago, 0.16 foot higher than the average stage of July for the last 10 years, 1.71 feet below the high stage of July, 1863, and 2.42 feet above the low stage of July 1895. It will probably fall 0.3 foot during August.

TORNADO AT GRAND RAPIDS, MICH.

[By C. F. SCHNEIDER, Section Director.]

During the early morning of Saturday, July 13, 1912, a thunderstorm of considerable severity occurred, beginning about 3.30 a. m. and ending at 10 a. m.

Shortly after 4 a. m. a small tornado passed through the center of the city, apparently touching the ground in only one place, but being near enough to the earth to cause serious damage to trees and small buildings over a path about a mile in length and varying from 200 to 1,000 feet in width. However, the path of great destruction was not over 50 to 75 feet wide.

The preceding day had been warm and sultry and the temperature did not fall as rapidly as usual during the night, the thermometer registering 76° at 4 a. m. There was a fall of 9° within 15 minutes immediately after the passage of the tornado.

The destructive effect of the tornado was first manifested at the southern boundary of John Ball Park, in the extreme southwestern part of the city. At this point several trees were uprooted and one was carried about 10 feet and hurled across the cables of the Grand Rapids & Muskegon Power Co., bringing poles and wires down in the street. The greenhouses in the park were damaged by falling branches and poles, and about one block east a small barn was overturned.

From this point to the river the storm passed through a rather thinly built-up section and did some damage at intervals. One house in process of construction was blown from its foundation and a barn was overturned.

The tornado then crossed the river and apparently dropped on the baseball grounds with full force. It unroofed the grandstand and carried sections of the roof northward from 50 to 100 feet, dropping them in the midst of an assembled crowd of farmers, grocers, and hucksters at the market. The whirling, funnel-shaped cloud was plainly seen, but owing to the darkness it had approached so near before observed that no effort could be made to get out of its path.

TABLE 1.—*Climatological data for July, 1912. District No. 4, Lake Region.*

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.			
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of overcast days.			
<i>Minnesota.</i>																					
Cloquet.	Carlton.	800	1	63.6	- 3.4	90	7	31	19	41	1.90	- 1.41	0.58	0	9	13	13	5	w.	W. H. Kenety.	
Duluth.	St. Louis.	1,133	41	62.6	- 3.4	88	27	43	15	35	2.24	- 1.41	0.54	0	13	8	23	8	ne.	U. S. Weather Bureau.	
Floodwood.	do.	1,257	6								2.16	- 1.41	0.49	0	8	8	23	8	s.	M. H. Schussler.	
Stephens mine.	do.	1,500	5	66.4	- 0.8	95	6	31	19	47	1.79	- 1.41	0.47	0	7	19	7	5	s.	Oliver Iron Mining Co.	
Two Harbors.	Lake.	614	18	62.8	- 0.8	90	7	39	16	47	2.17	- 2.04	0.50	0	10	3	16	12	ne.	G. W. Watts.	
Virgina.	St. Louis.	1,434	18	66.7	+ 2.0	90	5†	35	19	39	2.25	- 2.53	0.40	0	10	16	8	7	se.	Oliver Iron Mining Co.	
<i>Wisconsin.</i>																					
Appleton.	Outagamie.	795	11	72.2	+ 2.1	97	6	46	16	33	8.76	+ 3.80	3.34	0	13	14	14	3	s.	Wm. O. Thiede.	
Ashland.	Ashland.	647	21	67.7	- 0.3	93	6	39	16†	42	2.13	- 1.94	0.68	0	10	14	10	7	ne.	Sam Wheeler.	
Bayfield.	Bayfield.	635	3	67.2*	- 0.3	94 ^a	6	45 ^a	19	36 ^a	2.03	- 1.94	0.52	0	7	12 ^b	14 ^b	sw.	Frank Kern.		
Cecil.	Shawano.	804	14	67.9	- 1.0	94	6	42	19†	39	11.88	+ 8.42	7.39	0	14	12	14	5	se.	Louis W. Schmidt.	
Cornucopia.	Bayfield.	0	64.2	-		88	7	35	19	40	1.90	-	0.65	0	11	6	17	8	sw.	Reed Fruit Co.	
Crandon.	Forest.	1,060	17	66.2	- 0.6	90	6	38	19	35	4.55	+ 1.00	1.99	0	15	13	10	8	nw.	Frank Shoemaker.	
Florence.	Fond du Lac.	1,293	21	66.0	+ 0.4	98	6	44	16	40	2.56	- 1.54	0.51	0	10	20	4	7	se.	Edward A. Seeley.	
Grand River Locks.	Marquette.	800	26	70.6	+ 0.6	98	6	44	19	40	7.86	+ 4.33	2.44	0	12	25	4	2	s.	Jerry Parkinson.	
Green Bay.	Brown.	617	26	69.2	- 0.3	94	6	48	19	27	7.46	+ 3.95	4.39	0	8	27	3	1	s.	U. S. Weather Bureau.	
High Falls.	Marinette.	810	0	68.4	-	95	6	35	19	38	5.05	-	1.50	0	14	12	11	8	se.	No. Hydro-Elec. Power Co.	
Iron River.	Bayfield.	1,096	3	67.3	-	94	5	38	19	39	2.28	-	0.37	0	14	17	10	4	s.	Winfield E. Tripp.	
Kewaunee.	Kewaunee.	590	3	64.0	-	91	9	46	19	35	9.30	-	4.92	0	11	14	6	11	s.	Eugene V. Kimball.	
Manitowoc.	Manitowoc.	616	61	65.4	- 2.1	94	9	45	19	32	12.90	+ 9.33	6.31	0	14	4	17	10	se.	Johanna Lüps.	
Menasha.	Winnebago.	764	15								10.17	+ 6.67	2.62	0	12	24	2	5	se.	Geo. T. Allanson.	
Menominee Falls.	Waukesha.	842	3	69.6*	-	96 ^a	5	43 ^a	16	39 ^a	4.92	-	2.34	0	10	19 ^a	10 ^a	1 ^a	s.	Arthur H. Christman.	
Milwaukee.	Milwaukee.	681	42	69.2	- 0.5	92	5	53	17	27	4.92	+ 1.91	2.19	0	11	10	15	6	se.	U. S. Weather Bureau.	
New London.	Outagamie.	762	16	70.2	0.0	95	6	45	16	32	8.69	+ 4.22	3.13	0	14	10	14	7	se.	August H. Pape.	
Oconto.	Oconto.	590	21	68.2	- 0.8	92	6	44	16†	30	9.43	+ 6.11	4.21	0	13	15	9	7	s.	Wm. K. Smith.	
Oshkosh.	Winnebago.	744	23	71.2*	- 0.3	97 ^a	6	40 ^a	19	33 ^a	7.01	+ 2.93	1.95	0	12	18	12	1	se.	Evan Vincent.	
Pine River.	Waushara.	900	17	70.5	+ 0.5	95	6	45	17	31	9.08	+ 4.94	2.73	0	14	3 ^L	15 ^L	1 ^L	se.	Geo. H. Carpenter.	
Plum Island.	Door.	588	4	65.4	-	88	9	45	19	26	3.50	-	0.80	0	16	9	10	12	s.	Geo. C. Robinson.	
Plymouth.	Sheboygan.	843	2	68.8	-	95	6	44	16	38	6.12	-	2.96	0	13	13	14	4	s.	Paul O. Feldrappe.	
Port Washington.	Ozaukee.	713	19	67.0	- 1.4	94	9	46	16†	32	6.34	+ 3.01	1.63	0	10	15	11	5	se.	Richard C. Kann.	
Racine.	Racine.	633	15	69.2	- 2.0	91	24	48	19	29	4.49	+ 2.99	2.35	0	11	14	12	5	se.	Daniel Davis.	
Ripon.	Fond du Lac.	935	2	70.8	-	96	6	46	16	32	7.86	-	2.30	0	13	11	17	3	se.	Ripon College.	
Sheboygan.	Sheboygan.	831	13	67.9	- 1.6	97	9	48	18	35	6.44	+ 2.85	2.77	0	11	14	15	2	se.	Louis C. Meyer.	
Sturgeon Bay.	Door.	600	13	63.8	- 1.8	94	13	36	18	28	7.27	-	0.87	0	15	7	17	7	nw.	Adam N. Dier.	
Superior.	Douglas.	671	3	62.4	-	87	27	41	19	35	1.39	-	0.25	0	15	8	18	5	ne.	Edward B. Banks.	
Waupaca.	Waupaca.	857	17	69.8	- 0.9	97	6	44	16†	35	8.87	+ 5.39	2.18	0	14	12	8	11	sw.	James H. Flagg.	
<i>Illinois.</i>																					
Chicago.	Cook.	823	42	72.9	+ 0.5	92	5	57	16	24	3.86	+ 0.22	1.87	0	9	8	15	8	sw.	U. S. Weather Bureau.	
Evanston.	do.	601	...	72.2	-	93	5	54	16	26	3.15	+ 0.18	0.71	0	10	11	8	12	...	City of Evanston.	
<i>Indiana.</i>																					
Auburn.	Dekalb.	874	16	72.2	0.0	92	15†	46	19	32	3.10	- 0.53	0.90	0	7	10	6	15	sw.	Mrs. Josie B. Kuhlman.	
Berne.	Adams.	849	3	74.1	-	93	24	53	19	27	5.55	-	2.56	0	15	10	18	3	sw.	Henry M. Reusser.	
Elkhart.	Elkhart.	801	10																...	Dr. Miles Medical Co.	
Fort Wayne.	Allen.	856	16	73.2	- 0.3	90	24	53	19	33	3.38	- 0.28	1.13	0	10	10	17	4	sw.	U. S. Weather Bureau.	
Hammond.	Lake.	598	21	73.5	+ 0.4	94	4†	49	19	37	2.99	+ 0.22	1.04	0	6	7	17	7	sw.	Carson W. Whitney.	
Howe.	Lagrange.	886	7	72.8	-	92	8†	48	19	34	4.69	-	1.39	0	8	19	0	12	...	James E. Zook.	
Notre Dame.	St. Joseph.	712	1	71.0	-	90	6	51	19	24	4.43	-	3.04	0	12	16	14	5	...	U. S. Weather Bureau.	
Whiting.	Lake.	606	3	73.0	-	96	5†	56	22	27	3.43	-	1.19	0	11	18	7	6	sw.	D. H. Boyd.	
<i>Michigan—Upper Peninsula.</i>																					
Baraga.	Baraga.	623	10								1.20	- 1.37	0.40	0	6	12	0	19 ^b	w.	D., S. S. & A. Ry.	
Bergland.	Ontonagon.	1,300	2	67.0	+ 2.4	97 ^b	7	34 ^b	21	47 ^b	-			0	...	17 ^b	3 ^b	9 ^b	sw.	Frank McMonigal.	
Blaney.	Schoolcraft.	4																	...		
Calumet.	Houghton.	1,246	24	63.4	- 0.9	87	8	44	15	26	4.47	+ 1.66	1.00	0	12	18	9	4	e.	E. S. Grierson.	
Chatham.	Alger.	875	11	62.1	- 1.2	93	6	29	16†	45	1.76	- 2.20	0.55	0	10	17	6	8	n.	U. P. Experiment Station.	
Deer Park.	Luce.	610	11	63.8	+ 2.2	100	6	37	16	44	0.50	- 2.36	0.40	0	2	12	4	15	nw.	Mrs. Sarah E. McGaw.	
Detour.	Chippewa.	585	11	62.0	+ 0.3	85	3†	46	21	34	2.92	+ 0.28	0.57	0	10	11	13	7	...	Linton Melvin.	
Eagle Harbor.	Keweenaw.	622	13	62.0	- 2.5	88	9	41	19	26	1.25	- 2.09	0.30	0	12	8	10	13	w.	John Nolen.	
Escanaba.	Delta.	612	39	64.0	- 0.5	88	9	41	19	26	1.26	- 1.51	0.52	0	10	15	2	14	sw.	U. S. Weather Bureau.	
Ewen.	Ontonagon.	1,147	11	65.4	+ 0.6	94	5	32	19	42	1.26	-	1.51	0.52	0	10	15	2	14	sw.	W. B. Hatfield.
Grand Marais.	Alger.	610	11	62.6	+ 1.2	91	6	43	1	35	1.06	- 1.88	0.40	0	6	20	6	5	s.	Mrs. Lena Truedell.	
Green.	Ontonagon.	622	1	69.6	-	94	10	55	1†	33	3.93	-	1.98	0	2	16	10	5	...	T. A. Green.	
Houghton.	Houghton.	668	11	65.2	- 0.5	90	8	47	19	29	5.16	+ 2.06	1.58	0	14	9	10	12	w.	U. S. Weather Bureau.	
Humboldt.	Marquette.	1,536	15	64.0*	+ 1.9	93 ^b	6	30 ^b	16†	49 ^b	4.00	+ 1.06	2.00	0	3	21 ^b	1 ^b	7 ^b	w.	D., S. S. & A. Ry.	
Iron Mountain.	Dickinson.	1,111	11	67.4	+ 1.1	94	6	38	16†	39	3.74	- 0.71</									

TABLE 1.—Climatological data for July, 1912. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.		
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeasured.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
Michigan—Lower Peninsula—Continued.																				
Alpena.	Alpena.	609	39	64.9	-0.9	86	9	43	19	26	2.57	-0.49	0.73	0	9	8	17	6	se.	U. S. Weather Bureau.
Ann Arbor.	Washtenaw.	930	32	71.0	-0.7	91	9	46	19	37	3.34	+0.13	1.01	0	11	8	16	7	nw.	University of Michigan.
Arbela.	Tuscola.	728	16	69.4	-1.6	93	9	40	19	38	6.70	+3.70	3.65	0	11	3	13	15	sw.	Wm. Atkin.
Battle Creek.	Calhoun.	822	28	70.4	-2.9	91	9	47	16	31	2.89	-0.52	1.11	0	9	8	16	7	sw.	Elmer E. Sager.
Bay City.	Bay.	503	16	70.4	-0.9	95	7	43	18	39	5.76	+2.18	1.90	0	10	11	16	4	sw.	Pere Marquette R. R.
Benzonia.	Benzie.	832	15	67.2	-0.7	93	6	38	19	34	4.19	+1.39	0.67	0	13	11	16	7	sw.	Wallace Nutting.
Berlin.	St. Clair.	23	70.2	+0.4	94	9	44	19	34	4.39	+1.57	2.46	0	15	2	25	4	sw.	R. O. Gould.	
Big Rapids.	Mecosta.	906	16	68.0	-0.5	90	6	40	19	31	10.23	+6.55	3.62	0	14	3	21	7	w.	Supt. Waterworks.
Blissfield.	Lenawee.	687	0	72.2	.....	93	14	46	18	41	2.33	.....	0.74	0	12	14	11	6	sw.	Harry Watson.
Bloomingdale.	Van Buren.	8	70.4	.....	94	5	46	19	33	5.07	.....	2.10	0	11	17	7	7	nw.	John M. Haven.	
Cadillac.	Wexford.	1,293	3	67.3	.....	89	6	40	19	31	4.55	.....	0.88	0	12	10	14	7	n.	Cadillac W. & L. Co.
Cassopolis.	Cass.	903	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	5	15	12	4	nw.	Pere Marquette R. R.
Charlevoix.	Charlevoix.	610	34	66.2	-1.4	95	6	44	16	35	1.69	-0.80	0.80	0	5	15	12	4	w.	City of Charlotte.
Charlotte.	Eaton.	8	70.1	.....	88	43	43	19	35	2.88	.....	1.12	0	7	14	9	8	s.	E. A. Bouchard.	
Cheboygan.	Cheboygan.	611	22	66.0	-0.8	93	6	38	1	38	1.52	-1.49	0.62	0	5	5	22	4	sw.	David Woodward.
Clinton.	Lenawee.	830	22	71.9	-0.7	97	9	45	1	44	2.46	-0.45	0.61	0	7	11	15	5	s.	L. S. & M. S. R. R.
Coldwater.	Branch.	984	15	72.6	+0.6	92	9	47	19	29	4.36	+0.08	1.75	0	11	19	9	3	sw.	W. N. Armstrong.
Concord.	Jackson.	7	71.2	.....	92	9	44	19	31	2.37	.....	0.50	0	7	10	20	1	sw.	G. R. M. P. Co.	
Croton.	Newaygo.	685	4	69.2	.....	90	6	42	19	32	8.71	.....	2.40	0	13	6	23	2	sw.	U. S. Weather Bureau.
Detroit.	Wayne.	730	41	71.2	-0.8	87	14	50	19	27	3.87	+0.39	2.53	0	11	13	15	3	sw.	H. J. Tobin.
Durand.	Shiawassee.	799	4	72.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	12	7	7	7	sw.	Detroit & Mackinaw Ry.
East Tawas.	Iosco.	590	15	66.2	-1.9	87	10	42	16	30	3.06	-0.43	1.30	0	11	20*	9*	1*	sw.	John Gilmore.
Eloise.	Wayne.	640	15	71.2	-1.6	91	5	47	19	32	4.31	+0.99	2.15	0	16	8	17	6	sw.	William L. Fisher.
Flint.	Genesee.	730	23	69.6	-0.3	93	8	42	1	38	6.22	+3.46	2.65	0	14	10	8	13	n.	Geo. Morency.
Frankfort.	Benzie.	589	8	64.6	.....	80	12	46	19	22	3.61	.....	1.32	0	7	9	0	22	s.	H. H. Hutchins.
Ganges.	Allegan.	665	3	68.2	.....	87	5	42	16	32	5.39	.....	1.97	0	12	15*	11*	4*	sw.	Michigan Central R. R.
Gaylord.	Otsego.	1,367	12	65.2*	-1.4	95	6	30*	28	45	2.72	-0.63	0.90	0	7	12	0	19	sw.	Geo. R. Smith.
Gladwin.	Gladwin.	794	16	.....	92*	6	45	16	32	4.49	+1.91	2.27	0	9	9	17	5	sw.	U. S. Weather Bureau.	
Grand Haven.	Ottawa.	628	31	67.8	-1.9	89	6	45	16	32	4.49	+1.91	2.27	0	9	9	17	5	sw.	Do.
Grand Rapids.	Kent.	707	23	70.8	-1.8	91	5	47	16	31	7.47	+4.84	2.92	0	13	5	14	12	sw.	Joseph W. Morris.
Grape.	Monroe.	625	22	72.3	+0.1	92	15	47	11	32	2.72	+0.37	0.63	0	10	7	23	1	sw.	Menzo Conklin.
Grass Lake.	Jackson.	989	6	72.4	.....	98	4	46	17	33	4.47	.....	1.00	0	12	12*	8*	9*	sw.	S. N. Insley.
Grayling.	Crawford.	1,147	22	66.6	-0.9	89	3†	37	19	40	8.81	-0.73	1.45	0	13	10	18	8	sw.	Pere Marquette R. R.
Harbor Beach.	Huron.	635	24	.....	90	4	45	16	30	3.30	+1.02	1.20	0	7	17	12	2	sw.	D. W. Mitchell.	
Harrison.	Clare.	1,158	19	67.8	-0.7	92	5	39	20	42	3.80	+6.23	1.45	0	5	12	11	1	sw.	P. R. Marquette R. R.
Harrisonville.	Alcona.	616	28	64.4	-2.4	87	10	41	1	29	3.24	+2.28	2.83	0	12	10	11	10	sw.	C. F. Leipprandt.
Hart.	Oceana.	698	20	.....	.....	.....	.....	.....	.....	.....	10.90	+8.44	3.30	0	10	12	13	6	sw.	A. D. De Garmo.
Hayes.	Huron.	620	22	69.0	+0.3	90	6†	43	3	42	3.72	+1.00	1.13	0	10	6	20	5	n.	C. L. Herron.
Highland.	Oakland.	830	20	.....	.....	.....	.....	.....	.....	.....	4.95	+1.95	1.94	0	14	8	13	6	sw.	City of Holland.
Hillsdale.	Hillsdale.	1,150	15	71.6	+0.2	90	6†	44	19	31	1.83	-1.94	0.78	0	8	13*	6*	11*	sw.	Frank Sharp.
Holland.	Ottawa.	610	6	70.0	.....	90	5	42	19	33	5.55	.....	2.98	0	14	11	15	5	sw.	O. L. Giddings.
Howell.	Livingston.	924	20	70.7	+0.3	90	6†	45	16	33	6.96	+4.13	1.90	0	10	12	8	11	sw.	City of Jackson.
Ivan.	Kalkaska.	23	66.4	-1.6	94	6	37	16	37	2.78	0.0	0.58	0	12	8	21	2	sw.	William Bice.	
Jackson.	Jackson.	927	15	71.6	-0.7	92	9	44	19	40	3.11	-0.22	1.15	0	12	9	15	7	sw.	Kalamazoo Asylum.
Jeddo.	St. Clair.	667	23	68.6	-0.9	90	9	44	19	30	5.78	+2.93	1.30	0	14	9	12	10	sw.	U. S. Weather Bureau.
Kalamazoo.	Kalamazoo.	955	36	70.6	-1.7	90	6†	47	19	32	3.50	-0.01	1.90	0	10	10	17	4	sw.	State Board of Health.
Lansing (Agr. Col.).	Ingham.	820	48	69.6	-1.3	93	9	43	19	35	5.06	+1.84	1.60	0	14	4	13	14	sw.	Michigan Home.
Lansing (Capitol).	do.	881	25	70.8	-0.3	91	3†	44	18	49	8.30	+5.06	3.10	0	13	7	4	20	sw.	Pere Marquette R. R.
Lapeer.	Lapeer.	827	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	8	13*	6*	11*	sw.	Pere Marquette R. R.
Ludington.	Mason.	586	14	64.5	-3.3	87	9	42	16	34	11.68	+9.23	4.30	0	6	19	9	3	sw.	E. B. Stuart.
Luther.	Lake.	1,028	2	67.0	.....	92	6	33	19	40	6.27	.....	1.25	0	14	8	15	8	sw.	Pere Marquette R. R.
Mackinaw.	Cheboygan.	592	21	.....	87	5†	35	16	41	41	0.35	2.86	0.35	0	1	5	24	4	sw.	George J. Tripp.
Mancelona.	Antrim.	1,121	16	66.0	-1.4	94	6	35	16	41	0.10	-2.53	0.06	0	5	24	4	sw.	Waterworks.	
Manistee.	Manistee.	600	15	68.0	+1.0	89	10	49*	19	29*	4.48	+4.48	2.40	-0.62	1.05	0	4	1	sw.	Pere Marquette R. R.
Marshall.	Calhoun.	896	0	71.6*	.....	89	10	49*	19	29*	4.33	+1.59	1.60	0	8	10	12	9	sw.	E. B. Stuart.
Midland.	Midland.	604	13	71.0	+0.3	93	7	41	1†	46	4.33	+1.59	1.60	0	8	10	12	9	sw.	Pere Marquette R. R.
Morenci.	LeMire.	811	5	72.1	.....	93	9	48	19	27	1.88	0.45	0	11	8	11	12	sw.	George G. Tripp.	
Mount Clemens.	Macomb.	615	12	71.5	-0.8	95	9	47	19	28	4.55	+1.14	1.15	0	8	12	4	15	e.	Waterworks.
Mount Pleasant.	Isabella.	826	13	.....	93*	11	35*	1	55*	0	.....	.....	.....	0	8	12	4	15	e.	Pere Marquette R. R.
Muskegon.	Muskegon.	587	16	69.2	-1.0	90	6	44	16†	31	4.31	+0.94	1.50	0	8	23	6	2	s.	G. R. & I. Ry.
Old Mission.	Grand Traverse.	858	18	67.5*	-1.4	95	6	42	16	35	2.30	-0.28	0.41	0	9	17	3	11	sw.	E. O. Ladd.
Olivet.	Eaton.	934	22	69.4	-1.2	86	4†	46	19	32	3.79	-0.17	1.25	0	9	17	3	11	w.	G. A. Knapp.
Omer.	Arenac.	616	13	69.2	+2.2	90	9	40	22	38	2.16	-0.39	0.62	0	12	16	1	14	w.	D. & M. Ry.
Onaway.	Presque Isle.	826	9	67.6	.....	92	7	40	16	33	0.41	.....	0.21	0	2	13	0	18	w.	Do.
Owosso.	Shiawassee.	731	15	72.1	-0.4	95	6	44	16†	38	5.56	+1.49	1.95	0	13	5	26	0	sw.	Owosso Sugar Co.

TABLE 1.—Climatological data for July, 1912. District No. 4—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.						Precipitation, in inches.						Sky.	Prevailing wind direction.	Observers.	
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeted.	Number of rainy days, 0.01 inch or more.				
Ohio—Continued.																			
Conneaut.	Ashtabula.	675	2	71.2	.....	94	6	51	1†	29	2.96	.....	0.81	0	10	8	15	8	sw. E. L. Ransom.
Findlay.	Hancock.	776	23	74.0	-0.2	94	15	52	19	33	9.75	+ 5.91	3.15	0	14	16	12	3	nw. Dr. E. A. Moser.
Fremont.	Sandusky.	628	10	74.1	+ 0.2	93	9	54	19	29	5.98	+ 1.96	2.23	0	9	17	8	6	sw. E. Stanley Thomas.
Hedges.	Paulding.	725	18	73.0	-0.3	92	15†	50	19	28	2.39	- 0.62	0.75	0	7	16	11	4	s. Chas. Stutzman.
Hillhouse.	Lake.	997	19	69.8	-0.8	90	7	47	27	29	3.98	- 0.30	1.65	0	10	10	20	1	nw. J. W. Doncaster.
Hiram.	Portage.	1,260	32	71.2†	+ 0.1	89	7	50	27	27	3.88	+ 0.15	2.00	0	8	11	19	1	sw. Prof. G. H. Colton.
Hudson.	Summit.	1,153	51	73.2†	+ 0.9	98†	8	52†	27	34	6.60	+ 2.43	2.29	0	10	19†	5†	14	sw. Dr. W. I. Chamberlain.
Lima.	Allen.	875	13	73.2	+ 0.1	92	24	52	19	26	6.50	+ 3.43	3.15	0	10	9	5	17	sw. Miss Ollie De Long.
Medina.	Medina.	944	24	71.6	-0.8	91	5	49	27	32	5.00	+ 0.63	1.54	0	10	12	12	7	s. F. W. Clark.
Montpelier.	Williams.	880	20	73.6	+ 1.2	92	24	49	19	30	2.30	- 1.67	1.10	0	5	14	12	5	sw. G. L. Laser.
Napoleon.	Henry.	680	25	73.1	+ 0.1	92	15	56	23†	26	3.25	- 0.15	1.32	0	10	8	17	6	w. A. C. Senter.
New Bremen.	Auglaize.	1,038	19	72.9	-1.3	92	24	53	19	24	8.89	+ 5.68	2.68	0	12	8	17	6	sw. Miss Lillian Grothaus.
North Royalton.	Cuyahoga.	1,000	19	70.9	-1.5	90	5†	50	26†	29	7.00	+ 2.55	2.68	0	10	12	17	2	nw. W. S. Edgerton.
Norwalk.	Huron.	719	26	73.4	+ 0.5	93	8†	52	1	29	3.59	- 0.88	1.15	0	12	9	15	7	w. Giles R. Gregory.
Oberlin.	Lorain.	855	37	72.4	0.0	91	9†	51	1	29	7.24	+ 3.51	2.18	0	20	8	16	7	n. Prof. F. F. Jewett.
Ottawa.	Putnam.	720	19	72.9	-0.9	90	15†	19	28	6.73	+ 2.98	2.23	0	12	2	22	7	sw. Prof. J. T. Maidlow.	
Sandusky.	Erie.	629	35	72.6	-1.0	89	9	59	20	19	4.93	+ 1.14	0.98	0	14	7	15	9	sw. U. S. Weather Bureau.
Tiffin.	Seneca.	775	30	74.0	+ 0.4	89	6†	57	19	24	4.03	+ 0.08	1.44	0	12	11	19	1	sw. Prof. T. H. Sonnedecker.
Toledo.	Lucas.	769	41	72.4	-1.3	91	15	52	19	29	6.60	+ 0.36	0.84	0	11	9	15	7	sw. U. S. Weather Bureau.
Upper Sandusky.	Wyandot.	854	29	73.0	-0.8	91	15	54	19	25	6.68	+ 3.10	1.26	0	12	5	17	9	sw. Robert E. Tracht.
Vickery.	Sandusky.	588	19	73.1	-0.1	93	8†	55	19	32	6.96	+ 2.80	2.07	0	13	2	23	6	ne. John W. Barr.
Wauseon.	Fulton.	780	40	73.1	+ 0.3	94	15	47	19	31	1.96	- 1.98	0.63	0	11	9	16	6	s. Thomas Mikesell.
Wickliffe.	Lake.	649	.....	.....	.....	.....	.....	.....	.....	6.92	.....	3.30	0	11	14	11	6	s. C. M. Richardson.	
Pennsylvania.																			
Erie.	Erie.	658	39	70.4	-1.4	92	15	53	31	28	3.09	- 0.12	1.33	0	12	4	19	8	s. U. S. Weather Bureau.
New York.																			
Adams Center.	Jefferson.	540	21	72.3	+ 2.4	97	8	48	1†	30	2.38	- 2.10	1.98	0	7	16	13	2	sw. A. E. Cooley.
Angelica.	Allegany.	1,340	29	67.0	-0.6	92†	8†	32	1	46	2.42	- 1.78	0.59	0	12	2	12	17	w. Charles P. Arnold.
Appleton.	Niagara.	270	21	69.8	+ 0.1	96	8	40	1	31	1.33	- 2.63	0.75	0	7	17	12	2	sw. H. A. Van Wagoner.
Auburn.	Cayuga.	715	43	70.4	-0.1	94	8	45	1	32	3.17	- 0.62	1.00	0	9	26	4	1	ne. A. H. Underwood.
Avon.	Livingston.	585	17	70.4	+ 0.5	94	6†	42	1	34	4.25	+ 0.48	0.98	0	8	17	12	2	w. W. G. Markham.
Blue Mountain Lake.	Hamilton.	1,750	12	71.2	0.0	97	15	46	20	33	1.86	- 2.46	0.76	0	12	10	20	1	w. B. F. Merwin.
Brockport.	Monroe.	537	16	71.2	0.0	97	15	46	20	33	1.86	- 2.46	0.76	0	12	10	20	1	sw. W. H. Lennon.
Buffalo.	Erie.	767	61	70.1	-0.1	91	6	50	19	26	1.41	- 1.99	0.36	0	6	9	16	6	sw. U. S. Weather Bureau.
Canton.	St. Lawrence.	448	18	67.8	-1.1	92	10	41	23	36	1.82	- 1.41	0.70	0	9	14	11	6	sw. Do.
Cape Vincent.	Jefferson.	246	7	70.0	.....	91	6	45	23	36	3.08	.....	1.52	0	3	21	7	3	s. J. Harry Grapotte.
Castile.	Wyoming.	.....	0	69.7	.....	94	8†	37	1	42	3.05	.....	0.79	0	11	2	2	nw. Miss Caroline Bishop.	
Chazy.	Clinton.	151	12	69.3	+ 0.5	94	8	45	1†	39	5.14	+ 1.08	2.60	0	8	19	8	4	s. W. R. North.
Dannemora.	Elba.	1,490	7	70.1	.....	95	10	47	20	40	3.83	.....	1.72	0	9	13	10	8	sw. Dr. W. N. Thayer.
Genesee.	Genesee.	500	13	71.7	+ 0.1	95	6	42	1	34	2.69	- 1.28	0.70	0	9	18	12	1	sw. Joseph S. Willford.
Fayetteville.	Onondaga.	530	11	71.7	+ 0.1	95	6	42	1	34	2.69	- 1.28	0.70	0	9	18	12	1	sw. Dana H. Wells.
Gabriels.	Franklin.	1,729	10	64.6	.....	94	10	34	1†	46	3.80	.....	1.40	0	9	17	10	4	w. Gabriels Sanitarium.
Harkness.	Clinton.	622	10	68.8	-0.2	95	8	40	1	35	3.66	0.00	0.96	0	12	25	4	2	w. J. W. Harkness.
Hemlock Lake.	Livingston.	900	14	70.3	-0.6	90	9†	42	1	35	4.34	+ 0.30	1.28	0	12	10	19	3	nw. Grant Harvey.
Hunt.	.....	1,321	13	69.6	-0.5	97	6	36	1	42	3.14	- 1.42	0.96	0	10	9	13	9	sw. W. S. Barager.
Ithaca.	Tompkins.	928	34	70.9	+ 0.3	96	8	42	1	39	2.64	- 1.11	1.03	0	16	8	18	5	nw. U. S. Weather Bureau.
Keene Valley.	Essex.	1,000	14	66.9	-0.1	98	37	1	49	2.91	- 1.00	0.71	0	13	14	11	6	s. E. R. Wells.	
King Ferry.	Cayuga.	12	.....	.....	.....	.....	.....	.....	.....	5.57	+ 1.48	1.52	0	9	17	10	4	nw. Luticius A. Goodyear.	
Lake George.	Warren.	350	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	sw. Charles Forsell.
Lake Placid Club.	Essex.	1,864	4	59.7	.....	88	10	32	1†	38	6.10	.....	3.02	0	11	16	13	2	nw. Henry van Hoevenberg.
Lockport.	Niagara.	520	25	71.2	+ 0.8	94	6†	44	1	32	3.32	- 2.50	0.70	0	6	17	13	1	sw. Robert N. Clark.
Lowville.	Lewis.	900	45	69.8	+ 2.3	95	8†	39	1	41	1.79	- 1.92	1.03	0	8	21	9	1	w. Prof. W. F. H. Breeze.
Moirs.	Franklin.	200	12	68.4	-0.6	93	6†	39	23	38	2.31	- 2.07	0.85	0	6	22	6	3	sw. C. E. McBride.
Nehasane.	Hamilton.	1,750	4	63.8	.....	91	10	31	1	46	4.29	.....	1.98	0	6	21	9	1	nw. L. W. Brown.
North Lake.	Herkimer.	1,822	11	66.0	.....	93	8	40	23	50	2.34	.....	1.46	0	3	27	3	1	w. John F. Redmond.
Ogdensburg.	St. Lawrence.	175	28	68.3	-0.8	90	6†	45	24	35	1.92	- 1.28	0.44	0	6	16	12	3	s. State Hospital.
Old Forge.	Herkimer.	1,733	4	64.4	.....	91	8	33	1	44	3.33	.....	0.92	0	10	17	7	4	s. Mrs. S. W. Nelson.
Oswego.	Oswego.	335	42	68.5	-1.1	91	15	46	5	39	3.97	.....	1.00	0	13	14	14	4	s. U. S. Weather Bureau.
Otto.	Cattaraugus.	1,410	8	69.2	.....	89	15	46	5	39	3.97	.....	1.75	0	8	25	5	1	nw. William J. Winke.
Palermo.	Oswego.	460	53	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	8	25	5	1	sw. E. B. Bartlett.
Perry City.	Schuyler.	1,038	32	67.9	-0.9	94	3†	33	1	49	2.98	- 1.25	0.69	0	11	6	16	9	sw. W. H. Jeffers.
Philadelphia.	Philadelphia.	485	6	69.6	.....	92	8†	41	1	38	2.28	.....	1.36	0	8	15	15	1	w. E. D. Babcock.
Potsdam.	St. Lawrence.	300	36	70.6	+ 2.3	95	7†	42	24	42	1.81	- 2.53	0.62	0	6	20	7	2	s. A. E. Sutherland.
Raquette Lake.	Hamilton.	1,776	4	66.6	.....	92	10	37	1	41	3.35	.....	1.41	0	9	17	10	4	sw. R. J. Dunning.
Rochester.	Monroe.	523	83	71.0	+ 0.6	94	15	47	1	29	2.78	- 0.31	0.97	0	13	11	17	3	w. U. S. Weather Bureau.
Romulus.	Seneca.	719	20	70.2	-1.4	94	15	43	1	34	3.77	+ 0.23	1.12	0					

TABLE 2.—*Daily precipitation for July, 1912. District No. 4, Lake Region.*

TABLE 2.—*Daily precipitation for July, 1912. District No. 4—Continued.*

MONTHLY WEATHER REVIEW.

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TABLE 2.—Daily precipitation for July, 1912. District No. 4—Continued.

Stations.	Watershed.	Day of month.																													Total.			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Ohio—Continued.																																		
Lima || .	Maumee.	1.20	T.	.05	T.	.	T.	.25	T.	T.	.11	.	.54	3.15	.	28	T.	.55	.31	T.	T.	T.	.12	.10	.20	6.50								
Medina	Lake Erie	T.	T.	.	.07	.	T.	.19	T.	T.	.	T.	1.54	.28	.	28	T.	1.25	.	T.	T.	T.	.50	.50	.04	.08	5.00							
Montpelier	Maumee.	.10	T.56	2.30			
Napoleon	do.	.25	.22	T.	.	.	T.	.10	.3210	.03	.38	3.25			
New Bremen	do.	.93	T.	.02	.	.09	.	.10	.01	.31	.	2.68	.35	1.03	1.55	.	.	1.35	T.	8.89				
North Royalton	Lake Erie	.	.02	.	.15	.	.9004	2.68	.67	.	18	.	.93	1.31	7.00			
Norwalk || |	do.	.21	.25	.01	.	.06	.	.07	.08	.58	.	.01	.	14.2	18	1.36	.11	.	.43	.02	.	.45	.	.65	.01	.01	3.59		
Oberlin	Maumee.	T.	1.05	.05	.	T.	.22	.03	.	.08	.	1.10	.17	2.23	.18	.	.	T.	1.00	6.73				
Ottawa	Lake Erie	.73	.3296	.04	T.	.	.55	.01	.98	.	.	.	T.	.23	.	.01	.49	T.	T.	.	.10	.01	.37	T.	4.93				
Sandusky	do.	.09	.17	.	T.	.	.2204	1.09	.	T.	.01	T.	1.44	T.	.33	4.03				
Tiffin	Maumee.	.17	T.	T.	T.	.31	.04	T.	T.	.	.	.	.13	.74	.	.	.	T.	.66	.	.	.	.	.	.	.	.	.	3.00		
Toledo	do.	6.68			
Upper Sandusky	Sandusky.	.32	.68	.72	T.	.	.10	T.	1.10	.4050	6.96				
Vickery	Lake Erie	.	.02	.38	.	.	.08	.	T.	.01	.	.	.31	.	.03	.	.	T.	.44	.01	.	.42	.21	T.	1.96				
Wauseon || |	Maumee.	.	.25	.07	1.19	.93	.13	.16	6.92				
Wickliffe || |	Lake Erie	.	.53	.04	6.92			
Pennsylvania.																																		
Erie	Lake Erie	.	.01	T.	.	.	.	T.	T.	.01	.	1.33	.	.1405	T.	.05	.	T.	.53	.20	.02	.	T.	.34	.16	.25	3.09			
New York.																																		
Adams Center	L. Ontario.	.	T.	.1234	.59	.05	T.	.09	T.	.20	2.38			
Angelica	Genesee.11	T.	T.	2.42				
Appleton	L. Ontario.	T.	.42	1.33				
Auburn	Oswego.	.	T.	.39	.98	1.3	.08	.12	T.	.	T.	.20	3.17				
Avon	Genesee.	.	T.	.39	.15	.	T.42	4.25				
Blue Mountain Lake	Raquette.	T.	1.55			
Brockport	L. Ontario.	.	.06	.03	.	.	.	.	.	.	.	.	T.	.25	T.	.17	.	.04	.02	.	.	.	.	.	.	.	.	.	1.86		
Buffalo	Lake Erie	T.	.	T.	1.41				
Canton	Grass.	T.	1.82			
Cape Vincent	St. Lawrence.	T.	3.08			
Carvers Falls	L. Champ'n.	T.	3.08			
Castle	Genesee.	.	.	.	.	.	.	.	.	.	.	.	T.	.53	.	.55	.	T.	.	.	.	.	.	.	.	.	.	.	3.05		
Chazy	L. Champ'n.	.	.20	.	.	.	.	.	.	.	.	.	2.60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.14		
Dannemora	do.	T.	.42	.	.	.	.	.	.	.	.	.	1.72	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.83		
Elba	L. Ontario.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.74		
Faust	Raquette.	.	T.	.12	.13	.	T.	.	.	.	.	.	.49	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.69		
Fayetteville	Oswego.	.	T.	.96	.08	.	T.	.	.	.	.	.	.39	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.66		
Gabriels	St. Regis.	.	T.	.10	.35	.10	.	.	.	.	.	.	.25	.05	.05	T.	.	.50	T.	.14	.	.	.	.	.	.	.	.	3.80		
Harkness	L. Champ'n.	.	T.	.96	.08	.	T.	.	.	.	.	.	.17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.44		
Hemlock Lake	Genesee.	.	T.	.60	.05	.128	.	.	.	.	.	.	.17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.34		
Hunt	do.	.	T.	.09	.32	.	.	.	.	.	.	.	.50	.	.08	.	.10	.	.	.	.	.	.	.	.	.	.	.	3.14		
Ithaca	Oswego.	.	T.	.27	.22	T.	.	.	.	.	.	.	.03	.04	.02	T.	.	.03	.16	.06	.01	.04	.	.	.	.	.	2.64			
Keene Valley	Ausable.	.	T.	.06	.48	.71	.09	.	.	.	.	.	.05	T.	.34	.	.26	.21	.	.09	.	.	.	.	.	.	.	2.91			
King Ferry	Oswego.	.	T.	.89	.	.	.	.	.	.	.	.	.21	.66	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5.57		
Lake George	L. Champ'n.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6.10		
Lake Placid Club	Ausable, W. b.	.	T.	.42	.46	T.	.	.	.	.	.	.	3.02	.05	.	.	.	.	.	.	.	.	.	.	.	.	.	1.32			
Lockport	L. Ontario.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.79		
Lowville	Black.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.31		
Moirâ	St. Lawrence.	.	.	.	.	.	.	.	.	.	.	.	T.	.49	1.98	.	.	.	.	.	.	.	.	.	.	.	.	.	4.29		
Nehasane	Black.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.34		
North Lake	do.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.92		
Ogdensburg	St. Lawrence.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.33		
Old Forge	Black.	.	.	.	.	.	.	.	.	.	.	.	T.	.06	.01	.	.	.	.	.	.	.	.	.	.	.	.	.	3.49		
Oswego	L. Ontario.	.	T.	.18	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2.49			
Otto	Lake Erie.	.	T.	.16	.15	.20	.16	.	.	.	.	.	T.	.12	1.00	.40	.55	T.	.	.16	.02	.16	.	.	.	.	.	3.97			
Palermo	L. Ontario.	.	T.	.30	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.75			
Perry City	Oswego.	.	T.	.25	.	.	.	.	.	.	.	.	T.	.24	.37	.09	.03	T.	.	.69	.	.	.	.	.	.	.	2.98			
Philadelphia	St. Lawrence.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1.81			
Potsdam	Raquette.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.35			
Raquette Lake	do.	.	.	.	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3.78			
Rochester	Genesee.	.	T.	.06	.29	.02	.	.	.	.	.	.	T.	.09	.10	.	.	T.	.97	.	T.	.10	.	.	.	.	.	2.78			
Shortsville	Oswego.	.	T.	.71	.	.	.	.	.	.	.	.	T.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4.75			
Skaneateles	do.	T.	.	T.	.23	T.	.	.	.	.	.	.	T.	.10	.11	.03	.09	T.	.	.08	.11	.37	.	.	.	.	.	13.26			
Syracuse	do.	T.	.105	.25	.	.	.	.	.	.	.	.	T.	.11	.	.51	.	T.													

TABLE 3.—Maximum and minimum temperatures for July, 1912. District No. 4, Lake Region.

Date.	Duluth, Minn.		Wisconsin.				Chicago, Ill.	Ft. Wayne, Ind.	Upper Michigan.								Lower Michigan.											
			Florence.		Green Bay.				Escanaba.		Ewen.		Houghton.		Marquette.		Sault Ste. Marie.		Alpena.		Battle Creek.		Cadillac.					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
1....	60	47	77	51	77	56	69	55	70	62	80	57	72	57	81	46	77	50	78	55	77	48	71	45	82	51	77	49
2....	65	52	83	43	84	60	70	56	82	66	84	63	70	60	85	43	79	51	85	59	81	46	70	49	88	61	83	57
3....	78	49	82	61	82	65	87	64	87	72	82	67	72	62	85	58	83	62	85	60	85	59	84	65	85	66	81	63
4....	78	64	86	63	82	68	88	64	89	70	86	68	86	64	85	54	82	62	85	58	83	61	82	68	86	64	85	66
5....	68	54	90	67	90	68	92	65	92	74	87	70	75	67	94	63	84	59	93	59	87	57	78	65	90	71	84	67
6....	87	52	93	67	94	67	84	69	84	75	87	73	80	66	92	66	87	68	98	60	93	63	85	69	90	69	89	67
7....	76	63	87	65	85	69	76	64	81	69	80	70	78	65	87	65	83	64	74	63	86	62	79	70	82	69	82	66
8....	71	59	88	62	92	69	87	65	85	71	84	69	78	65	88	62	90	60	93	64	88	63	79	69	87	67	87	69
9....	81	57	88	66	89	71	91	72	91	74	88	68	88	65	89	72	83	69	91	58	82	62	86	69	91	79	85	70
10....	70	56	79	62	78	65	83	62	84	69	81	67	75	56	75	45	74	56	76	55	71	54	85	61	87	69	83	69
11....	60	51	77	49	75	61	70	60	74	68	86	69	72	52	76	51	67	53	62	51	72	53	70	57	84	65	78	56
12....	70	53	79	56	82	61	84	62	84	69	86	64	73	59	80	55	79	54	80	61	77	50	70	58	89	61	82	59
13....	77	60	78	63	83	65	86	65	86	68	86	66	83	67	82	52	73	61	77	60	72	56	81	61	84	66	78	66
14....	74	51	82	55	85	60	81	59	89	71	89	68	74	60	81	48	83	56	84	62	80	50	70	58	88	61	83	62
15....	65	43	76	50	67	52	82	56	83	59	89	67	72	46	80	42	61	49	69	46	70	47	75	49	86	65	78	54
16....	71	50	71	35	72	50	64	55	62	57	77	61	63	42	73	34	74	47	72	45	67	40	63	48	78	47	73	42
17....	73	54	73	52	76	54	72	53	72	60	84	62	67	54	72	55	70	57	68	56	70	46	70	48	86	59	78	47
18....	64	47	64	46	65	52	71	58	72	61	83	60	62	47	67	40	59	49	56	48	61	46	68	47	77	64	70	55
19....	72	46	73	36	69	48	64	54	65	60	71	53	66	41	75	32	72	47	73	47	69	44	67	43	69	47	69	40
20....	61	54	67	48	60	53	62	56	84	61	78	58	64	51	72	40	68	56	71	52	72	46	69	48	66	57	67	50
21....	65	52	71	53	76	58	69	58	71	62	78	65	70	56	68	48	62	54	63	51	72	54	72	59	70	61	71	55
22....	58	50	74	53	76	58	72	61	72	62	81	61	66	52	72	55	61	54	69	52	70	49	65	55	80	57	74	57
23....	61	50	67	59	68	64	82	62	82	68	83	63	64	61	71	64	73	61	70	61	73	63	60	75	61	69	58	
24....	83	52	83	62	87	68	87	66	92	78	90	73	74	61	82	68	80	60	71	59	62	57	62	59	88	67	75	64
25....	76	59	76	59	75	62	80	65	85	68	84	64	70	58	79	56	67	57	71	58	63	53	74	60	83	67	74	62
26....	69	56	70	50	72	56	68	63	76	59	70	56	70	40	67	55	64	55	68	50	74	55	78	48	71	56	72	
27....	88	55	85	49	81	56	77	59	72	63	81	58	72	50	85	45	83	54	87	54	73	46	70	50	80	54	76	49
28....	79	63	81	60	85	63	84	63	85	66	80	67	72	58	80	48	73	58	78	55	76	61	81	64	76	59	78	60
29....	80	58	71	53	78	59	73	63	79	63	81	53	74	52	75	53	72	57	68	56	63	51	76	55	78	60	72	57
30....	70	53	63	51	70	56	72	60	82	63	80	57	62	49	75	52	63	54	59	51	63	46	65	50	73	66	66	53
31....	65	51	66	46	67	52	66	55	66	62	69	55	65	46	70	50	64	53	61	49	60	44	65	46	75	52	65	44
Mns.	71.5	53.6	77.4	54.6	78.1	60.2	77.2	61.2	79.5	66.3	82.2	64.1	71.8	56.3	78.9	52.0	74.0	56.5	75.1	55.6	73.3	52.0	73.1	56.7	82.1	61.5	76.8	57.8

Date.	Lower Michigan.				Ohio.				Erie, Pa.				New York.				Vermont.											
	Detroit.		Muskegon.		Cleveland.		Lima.		Sandusky.		Toledo.		Buffalo.		Canton.		Rochester.		Syracuse.		Burling-ton.		North-field.					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
1....	77	55	85	54	84	50	77	58	82	57	71	62	72	61	73	54	77	52	76	45	74	47	74	46	71	44	72	36
2....	82	64	84	60	90	53	84	66	84	63	81	64	83	63	86	60	83	59	85	57	83	49	82	42	80	55	90	48
3....	82	68	82	67	87	66	83	68	84	67	82	68	83	67	81	70	83	71	88	67	89	68	89	65	90	56	81	48
4....	84	67	91	64	90	63	81	69	85	65	85	67	85	66	84	70	80	70	87	68	87	69	88	70	80	67	90	56
5....	85	73	89	69	86	73	80	66	88	64	84	78	80	69	82	69	79	70	91	68	89	70	89	68	90	62	82	62
6....	86	71	90	71	93	68	87	68	86	69	88	71	86	71	89	70	91	72	91	69	91	70	92	67	92	62	92	62
7....	86	72	82	70	89	69	88	70	85	68	88	71	84	69	85	70	85	73	92	69	93	71	91	74	92	67	92	63
8....	86	72	85	67	87	69	84	72	87	69	84	72	87	70	84	73	84	74	92	65	93	72	94	69	90	64	92	63
9....	86	71	85	73	91	68	86	70	90	67	89	70	89	70	82	72	84	73	91	72	92	70	90	68	90	64	90	64
10....	86	67	83	70	89	72	86	72	80	66	88	69</																